ArevaEPRDCPEm Resource

From: Pederson Ronda M (AREVA NP INC) [Ronda.Pederson@areva.com]
Sent: Thursday, October 16, 2008 2:58 PM
To: Getachew Tesfaye
Cc: DELANO Karen V (AREVA NP INC); WELLS Russell D (AREVA NP INC); KOWALSKI David J (AREVA NP INC); BENNETT Kathy A (OFR) (AREVA NP INC)
Subject: Response to U.S. EPR Design Certification Application RAI No. 44, FSAR Ch 10, Supplement 1
Attachments: RAI 44 Supplement 1 Response US EPR DC.pdf

Getachew,

Attached please find AREVA NP Inc.'s (AREVA NP's) response to the subject request for additional information (RAI). The attached file, "RAI 44 Supplement 1 Response US EPR DC" provides technically correct and complete responses to each of the 5 questions.

Appended to this file are affected pages of the U.S. EPR Final Safety Analysis Report in redline-strikeout format which support the response to RAI 44 Supplement 1 Questions 10.03.06-1, 10.03.06-2, 10.03.06-3, 10.03.06-4 and 10.03.06-5.

The following table indicates the respective pages in the response document that contain AREVA NP's response to the subject questions.

Question #	Start Page	End Page
RAI 44 — 10.03.06-1	2	2
RAI 44 — 10.03.06-2	3	3
RAI 44 — 10.03.06-3	4	4
RAI 44 — 10.03.06-4	5	5
RAI 44 — 10.03.06-5	6	6

This concludes the formal AREVA NP response to RAI 44 and there are no questions from this RAI for which AREVA NP has not provided responses.

Sincerely,

Ronda Pederson
ronda.pederson@areva.com
Licensing Manager, U.S. EPR Design Certification
New Plants Deployment
AREVA NP Inc.
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3315 Old Forest Road
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From: WELLS Russell D (AREVA NP INC)
Sent: Thursday, August 28, 2008 5:57 PM
To: 'Getachew Tesfaye'
Cc: 'John Rycyna'; Pederson Ronda M (AREVA NP INC); KOWALSKI David J (AREVA NP INC); DELANO Karen V (AREVA NP INC)
Subject: Response to U.S. EPR Design Certification Application RAI No. 44, FSAR Ch 10

Getachew,

Attached please find AREVA NP Inc.'s response to the subject request for additional information (RAI). The attached file, "RAI 44 Response US EPR DC.pdf" states that complete answers cannot be currently provided for the 5 questions.

The following table provides the page(s) in the response document, "RAI 44 Response US EPR DC.pdf" containing the response to each question.

Question #	Start Page	End Page
RA1 44 — 10.03.06-1	2	2
RA1 44 — 10.03.06-2	3	3
RA1 44 — 10.03.06-3	4	4
RA1 44 — 10.03.06-4	5	5
RA1 44 — 10.03.06-5	6	6

Complete answers are provided for none of the 5 questions. The schedule for a technically correct and complete response to these questions is provided below.

Question #	Response Date
RA1 44 — 10.03.06-1	October 22, 2008
RA1 44 — 10.03.06-2	October 22, 2008
RA1 44 — 10.03.06-3	October 22, 2008
RA1 44 — 10.03.06-4	October 22, 2008
RA1 44 — 10.03.06-5	October 22, 2008

Sincerely,

(Russ Wells on behalf of)
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From: Getachew Tesfaye [mailto:Getachew.Tesfaye@nrc.gov]
Sent: Tuesday, July 29, 2008 4:13 PM
To: ZZ-DL-A-USEPR-DL
Cc: Robert Davis; David Terao; Peter Hearn; Joseph Colaccino; John Rycyna
Subject: U.S. EPR Design Certification Application RAI No. 44, FSAR Ch 10

Attached please find the subject requests for additional information (RAI). A draft of the RAI was provided to you on July 22, 2008, and on July 29, 2008, you informed us that the RAI is clear and no further clarification is needed. As a result, no change is made to the draft RAI. The schedule we have established for review of your application assumes technically correct and complete responses within 30 days of receipt of RAIs. For any RAIs that cannot be answered within 30 days, it is expected that a date for receipt of this information will be provided to the staff within the 30 day period so that the staff can assess how this information will impact the published schedule.

Thanks,

Getachew Tesfaye
Sr. Project Manager
NRO/DNRL/NARP
(301) 415-3361

Hearing Identifier: AREVA_EPR_DC_RAIs
Email Number: 233

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Subject: Response to U.S. EPR Design Certification Application RAI No. 44, FSAR Ch 10, Supplement 1
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Tracking Status: None

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Response to

Request for Additional Information No. 44, Supplement 1 Revision 0

7/29/2008

U. S. EPR Standard Design Certification
AREVA NP Inc.
Docket No. 52-020
SRP Section: 10.03.06 - Steam and Feedwater System Materials
Application Section: 10.3.6
CIB1 Branch

Question 10.03.06-1:

FSAR Tier 2, Table 10.3-11 lists material specifications and grades for ASME Code, Class 2 and 3 MS and FW piping and non-code piping. The applicant did not however include material specifications and grades for components such as valves and fittings. In addition, the applicant did not list weld filler material specifications and classifications. In order for the staff to determine that MS and FW systems materials meet the requirements of GDC 1 and 10 CFR 50.55a, the staff requests that the applicant modify Table 10.3-11 to include material specifications and grades for components such as valves and fittings used in the ASME Code Class 2 and 3 portions of the MS and FW systems. The staff also requests that the applicant provide weld filler material specifications and classifications that will be used in the ASME Code Class 2 and 3 portions of the MS and FW systems.

Response to Question 10.03.06-1:

U.S. EPR FSAR Tier 2, Table 10.3-11—Main Steam Supply System and Main Feedwater System Material Data, will be modified to include material specifications and grades for piping, fittings and valves.

FSAR Impact:

U.S. EPR FSAR Tier 2, Section 10.3.6.1 and Table 10.3-11 will be revised as described in the response and as indicated on the enclosed markup.

Question 10.03.06-2:

FSAR Tier 2, Section 10.3.6.3 states that MSSS and feedwater system piping material is flow accelerated corrosion (FAC) resistant, unless the application is specially evaluated and found to be non-susceptible to FAC. The applicant indicates that piping material resistant to FAC is constructed of carbon steel which contains a minimum of 0.10 percent chromium. Given that the material specifications listed in Table 10.3-11 do not contain minimum chromium content requirements, the staff requests that the applicant provide a note to Table 10.3-11 to indicate the aforementioned requirement for minimum chromium content for components that the applicant has determined are susceptible to FAC. In addition, the staff requests that the applicant provide a basis for its determination that carbon steel piping containing a minimum of 0.10 percent chromium is FAC resistant.

Response to Question 10.03.06-2:

The material specifications for piping, fittings and weld filler metals in systems found to be susceptible to flow accelerated corrosion (FAC) will include a requirement for minimum chromium content of 0.10 percent. A note will be added to U.S. EPR FSAR Tier 2, Table 10.3-11—Main Steam Supply System and Main Feedwater System Material Data, to specify this requirement.

The basis for the determination that carbon steel piping containing a minimum of 0.10 percent chromium is FAC resistant is provided in Section 5.2 of EPRI Technical Report NSAC-202L-R3, "Recommendations for an Effective Flow-Accelerated Corrosion Program."

FSAR Impact:

U.S. EPR FSAR Tier 2, Table 10.3-11 will be revised as described in the response and as indicated on the enclosed markup.

Question 10.03.06-3:

FSAR Tier 2, Section 10.3.6.3 indicates that Chrome-molybdenum or stainless steel also may be used in certain parts of the MSSS and feedwater system. However, Section 10.3.6.1 indicates that the MSSS and feedwater system piping material is not low-alloy steel and therefore RG 1.50 does not apply to the MSSS and feedwater system. The staff requests that the applicant provide an explanation of this inconsistency and modify the FSAR accordingly.

Response to Question 10.03.06-3:

The piping and fittings in the main steam supply system (MSSS) and main feedwater system are carbon steel as indicated in U.S. EPR FSAR Tier 2, Table 10.3-11—Main Steam Supply System and Main Feedwater System Material Data. If resistance to flow accelerated corrosion (FAC) is required, the carbon steel piping and fittings will have a minimum chromium content of 0.10 percent. Chrome-molybdenum or stainless steel piping may be used in other systems that are non-safety-related such as feedwater heater drains or cold reheat located in the Turbine Building to prevent erosion and corrosion.

The second paragraph in U.S. EPR FSAR Tier 2, Section 10.3.6.3 will be changed to read:

> "MSSS and main feedwater system piping and fittings are flow accelerated corrosion (FAC) resistant, unless the application is specifically evaluated and found to be non-susceptible to FAC degradation. Piping material resistant to FAC is constructed of carbon steel containing a minimum of 0.10 percent chromium. Chrome-molybdenum or stainless steel piping may be used in other systems that are non-safety related such as feedwater heater drains or cold reheat to prevent erosion and corrosion."

FSAR Impact:

U.S. EPR FSAR Tier 2, Section 10.3.6.3 will be revised as described in the response and as indicated on the enclosed markup.

Question 10.03.06-4:

FSAR Section 10.3.6.3 indicates that the design of the piping systems in the MSSS and feedwater system incorporates considerations to prevent erosion and corrosion. In order for the staff to complete its review of FSAR Section 10.3.6 regarding the EPR design attributes that mitigate the effects of FAC, the staff requests that the applicant provide the following information:

a. Provide a detailed discussion of how the design and layout of the MSSS, feedwater and condensate systems minimizes the effects of FAC from system piping and components configuration and geometry, water chemistry, piping and component material, fluid temperature (including flash points), and fluid velocity.

b. Identify the computer program (e.g., CHECWORKS) utilized to design systems in order to minimize the effects of FAC for the design life of the plant.

The staff requests that the aforementioned information be included in the EPR FSAR as it applies to all ASME Code and non-Code piping that may be susceptible to FAC.

Response to Question 10.03.06-4:

During the design phase, flow accelerated corrosion (FAC) is addressed by selecting FAC resistant materials and setting appropriate water chemistry limits. (Refer to U.S. EPR FSAR Tier 2, Section 10.3.5.) EPRI Technical Report NSAC-202L-R3 indicates that material selection and water chemistry are the most important factors in reducing FAC. Specific piping geometry will be determined using accepted industry practices to avoid high velocities or local turbulences and favor open geometries to minimize possible corrosion product accumulation sites. The following paragraph will be moved from U.S. EPR FSAR Tier 2, Section 10.4.7.3 and added to U.S. EPR FSAR Tier 2, Section 10.3.6.3 as a new second paragraph in this section:

> “The design includes material selection, limits on flow velocity and limits on water chemistry to reduce flow accelerated corrosion (FAC), and erosion and corrosion of piping and piping components. The design meets the guidance contained in GL 89-08 (Reference 14) and NSAC-202L-R3 (Reference 15) concerning acceptable inspection programs.”

Programs such as CHECWORKS address FAC monitoring and analysis in existing operating plants. Combined License Information Item 10.3-2 in U.S. EPR FSAR Tier 2, Table 1.8-2—U.S. EPR Combined License Information Items, specifies that a COL applicant that references the U.S. EPR design certification is responsible for developing a FAC condition monitoring program.

FSAR Impact:

U.S. EPR FSAR Tier 2, Sections 10.3.6.3, 10.4.7.3 and 10.4.7.6 will be revised as described in the response and as indicated on the enclosed markups.

Question 10.03.06-5:

Under SRP 10.3.6, specific areas of review by the staff include welding preheat temperatures for carbon steel and low alloy steel components and nondestructive examination procedures for tubular products. FSAR Section 10.3.6 does not include a discussion on either of the aforementioned topics.

a. The staff's expectations is that preheat temperatures for all carbon steel and low-alloy steel materials follow the guidance provided in ASME Section III, Appendix D, Article D-1000. The staff request that the applicant modify FSAR Section 10.3.6 accordingly.

With regard to nondestructive examination for tubular products, the staff requests that the applicant modify FSAR Section 10.3.6 to include the nondestructive examination requirements for tubular products in the ASME Code, Class 2 and 3 portions of MSSS and feedwater system.

Response to Question 10.03.06-5:

The following paragraphs will be added to U.S. EPR FSAR Tier 2, Section 10.3.6.1:

> "Preheat temperatures for carbon steel piping in the ASME Code Section III, Division 1, Class 2 and 3 portions of the MSSS and main feedwater system will follow the guidance provided in ASME Section III, Appendix D, Article D-1000. Preheat temperatures for carbon steel piping in the Non-ASME Section III portions of the MSSS and main feedwater system are in accordance with ASME B31.1".

> "Nondestructive examination for tubular products in the ASME Code, Class 2 and 3 portions of the MSSS and main feedwater system is in accordance with ASME Section III, Division 1, Sections NC-5000 and ND-5000."

FSAR Impact:

U.S. EPR FSAR Tier 2, Section 10.3.6.1 will be revised as described in the response and as indicated on the enclosed markup.

U.S. EPR Final Safety Analysis Report Markups

- Demineralized water is continuously monitored as it is being produced and the demineralized water storage is routinely sampled to verify makeup water quality.
- Air inleakage is detected by monitoring the condensate pump discharge for excessive dissolved oxygen and by monitoring the condenser air removal rate.

10.3.5.4 Condensate Polishing

Condensate polishers are used in the recirculation cleanup system during plant startup and shutdown to remove both dissolved and particulate contaminants prior to admitting feedwater to the steam generators. This practice achieves the required water purity in a shorter time and prevents these contaminants from entering the steam generators.

Condensate polishers are used during power operation in the event of an upset in chemistry conditions, for example, during periods of condenser cooling water leakage or when inadequate performance of the makeup water system would introduce impurities to the steam generators. Additional information on the condensate polishing system may be found in Section 10.4.6.

10.3.5.5 Primary to Secondary Leakage

Leakage of primary water into the steam generator via through-wall tube defects provides a source of radioactive iodine to the secondary system. The volatility of radioactive iodine is increased by acidic and oxidizing solutions. As described in Section 10.3.5.2, the U.S. EPR secondary side AVT chemistry is both basic and reducing. These conditions suppress the volatility of radioactive iodine species and any release via the air ejector will be minimized.

10.3.5.6 Chemical Addition System

Equipment is provided to inject controlled quantities of treatment chemicals as part of the secondary water chemistry program. These treatment chemicals are injected into the condensate pump discharge header.

10.3.6 Steam and Feedwater System Materials

10.3.6.1 Material Selection and Fabrication

~~Table 10.3-11—Main Steam and Main Feedwater Piping Material DataMain Steam Supply System and Main Feedwater System Material Data~~Table 10.3-11—Main Steam Supply System and Main Feedwater System Material Data, provides material data for the MSSS and main feedwater system~~ piping~~. The MSSS and main feedwater system do not use copper or copper alloy materials.

10.03.06-1

As required by GDC 1, material selection and fabrication requirements for Class 2 and 3 components per Reference 1 in safety-related portions of the MSSS and feedwater system are consistent with the quality group and seismic design classifications provided in Table 3.2-1. RG 1.84 describes acceptable code cases that may be used in conjunction with the above specifications.

Cleaning and handling of Class 2 and Class 3 components of the MSSS and feedwater system is in accordance with the acceptable procedures described in RG 1.37.

The guidance in RG 1.71 for additional welder qualification is applied for welds on ASME Class 2 and 3 components of the MSSS and feedwater system in locations of restricted direct physical and visual accessibility.

The MSSS and feedwater system piping material is not low-alloy steel; therefore, control preheat temperatures for welding low-alloy steel as described in RG 1.50 is not applicable to these systems.

10.03.06-5

Preheat temperatures for carbon steel piping in the ASME Code Section III, Division 1, Class 2 and 3 portions of the MSSS and main feedwater system will follow the guidance provided in ASME Section III, Appendix D, Article D-1000. Preheat temperatures for carbon steel piping in the Non-ASME Section III portions of the MSSS and main feedwater system are in accordance with ASME B31.1.

Non-destructive examination (NDE) for tubular products in the ASME Code, Class 2 and 3 portions of MSSS and main feedwater system is in accordance with ASME Section III, Division 1, Sections NC-5000 and ND-5000.

Preservice and inservice inspection of Class 2 and 3 components per Reference 1 in the MSSS and feedwater system are addressed in Section 6.6. The following requirements apply to the non-safety-related portions of the MSSS and feedwater system:

- Components are carbon steel.
- Piping is ASME B36.10 (Reference 10).
- Fittings are ASME B16.9 and B16.11 (Reference 11).
- Flanges are ASME B16.5 (Reference 11).

10.3.6.2 Fracture Toughness

The material specifications for pressure retaining materials in safety-related portions of the MSSS and feedwater system meet the fracture toughness requirements specified in the following for Quality Group B and Quality Group C components, respectively:

- ASME BPV Code, Section III, Class 2, Article NC-2300, (Reference 12).
- ASME BPV Code, Section III, Class 3, Article ND-2300, (Reference 13).

10.3.6.3 Flow-Accelerated Corrosion

The design of the piping systems in the MSSS and main feedwater system, including applicable material standards and inspection programs, incorporates considerations to prevent the occurrence of erosion and corrosion in these systems. Industry guidance and requirements for inspection and monitoring programs is found in Generic Letter 89-08 (Reference 14) and NSAC-202L-R3 (Reference 15).

10.03.06-4

The design includes material selection, limits on flow velocity and limits on water chemistry to reduce flow accelerated corrosion (FAC), and erosion and corrosion of piping and piping components. The design meets the guidance contained in GL 89-08 (Reference 14) and NSAC-202L (Reference 15) concerning acceptable inspection programs.

10.03.06-3

MSSS and main feedwater system piping ~~material is~~and fittings are ~~flow accelerated corrosion (~~FAC~~)~~ resistant, unless the application is specifically evaluated and found to be non-susceptible to FAC degradation. ~~As a minimum, p~~Piping material resistant to FAC is constructed of carbon steel containing a minimum of 0.10 percent chromium. Chrome-molybdenum or stainless steel piping~~also~~ may be used in ~~certain parts of the MSSS and feedwater system~~other systems that are non-safety related, such as feedwater heater drains or cold reheat to prevent erosion and corrosion.

The COL applicant that references the U.S. EPR design certification will develop a FAC condition monitoring program that is consistent with Generic Letter 89-08 and NSAC-202L-R3 for the carbon steel portions of the steam and power conversion systems that contain water or wet steam.

10.3.7 References

1. ASME Boiler and Pressure Vessel Code, Section III, “Rules for Construction of Nuclear Facility Components,” The American Society of Mechanical Engineers, 2004.

2. ANSI/ASME B31.1-2004, “Power Piping,” The American Society of Mechanical Engineers, 2004.

3. ASME Boiler and Pressure Vessel Code, Section III, Division 1, Subsection NC including Article NC-7000:“Overpressure Protection,” The American Society of Mechanical Engineers, 2004.

4. NUREG-0800, BTP 5-4, “Design Requirements of the Residual Heat Removal System,” Nuclear Regulatory Commission, Rev. 3, March 2007.

5. NUREG-0138, Issue 1, “Staff Discussion of Fifteen Technical Issues,” Nuclear Regulatory Commission, November 1976.

Table 10.3-11—~~Main Steam and Main Feedwater Piping Material Data~~Main Steam Supply System and Main Feedwater System Material Data

Segment	Material Specification		
Main Steam Line	**Pipe** [2]	**Fittings** [2] [5]	**Valves** [3]
Steam generator outlet to fixed restraint downstream of MSIV	ASME SA-106 Grade C	ASME SA-234 Grade WPC	ASME SA-216 Grade WCC or SA-105
Fixed restraint to high pressure turbine [1] [3]	ASTM A-106 Grade B	ASTM A-234 Grade WPB	ASTM A-216 Grade WCB or A-105
Main Feedwater Line			
Feedwater pump outlet to fixed restraint [1]	ASTM A-106 Grade B	ASTM A-234 Grade WPB	ASTM A-216 Grade WCB or A-105
Fixed restraint to steam generator	ASME SA-106 Grade B	ASME SA-234 Grade WPB	ASME SA-216 Grade WCB or SA-105

Notes:

1. Outside of the ASME Section III boundary.
2. The minimum chromium content of carbon steel piping, fittings and weld filler metals in the main steam supply system and main feedwater system shall be 0.10% for resistance to flow accelerated corrosion, unless exempted by the system design engineer. Portions of the main steam supply system and the main feedwater system that are not susceptible to flow accelerated corrosion degradation may be exempted.
3. Does not include the turbine stop and control valves or the turbine bypass valves.
4. The weld filler metal classifications used in the ASME Code Class 2 and 3 portions of the main steam supply system and main feedwater system are given in detailed specifications provided to the Certificate of Authorization Holder performing the welding on behalf of the owner. The Certificate of Authorization Holder is responsible for meeting the requirements of the detailed specifications, and the ASME code for weld filler metals. This includes requirements for strength, toughness, and other mechanical properties, service compatibility with the materials being joined, and other design criteria. The Certificate of Authorization Holder is an organization holding an ASME N certificate, NA certificate, or an NPT certificate to design and/or construct nuclear class 1, 2 or 3 components, install said components, or produce sub-assembly components.
5. Fittings include the pipe fittings furnished in accordance with ASME B16.9, such as tees, reducers, and laterals.

Next File

10.03.06-1

The design of the safety-related portions of the CFS satisfies GDC 44 regarding the capability to transfer heat from structures, systems and components important to safety to an ultimate heat sink.

- The emergency feedwater system (EFWS) is designed as a separate system from the CFS and has its own water supply. The CFS does not provide a flow path for emergency feedwater (EFW). The CFS does not perform safety-related functions with respect to transferring heat from structures, systems and components important to safety to the ultimate heat sink.

The design of the safety-related portions of the CFS satisfies GDC 45 regarding the performance of periodic inservice inspection of important components and equipment.

- The CFS is designed to permit periodic inspection of safety-related components. Inservice inspection of CFS components is performed in accordance with the ASME Boiler and Pressure Code, Section XI (Reference 7). Refer to Section 6.6 for a description of the inservice inspection program for the CFS valves.

10.03.06-4

- ~~The CFS design includes material selection, limits on flow velocity, other measures to reduce flow accelerated corrosion, and erosion and corrosion of piping and piping components. The design meets the guidance contained in GL 89-08 (Reference 8) and NSAC-202L (Reference 9) concerning acceptable inspection programs.~~ Refer to Section 10.3.6.3 for a description of flow accelerated corrosion.

The design of the safety-related portions of the CFS satisfies GDC 46 regarding the performance of functional testing of the system and components to demonstrate structural integrity and leak-tightness, operability and performance of active components.

- The CFS is designed to permit periodic testing during plant operation to confirm the structural and leak tight integrity of its components, as well as the operability and performance of the active components of the system. Refer to Section 3.9.6 for a description of the inservice testing program for CFS valves.

The design of the safety-related portions of the CFS satisfies single failure criterion. The means of feedwater and containment isolation are redundant and diverse. A single failure will not result in the loss of feedwater or containment isolation function.

- Inside the four valve rooms, the feedwater piping is routed in four individual and separated trains (called divisions) so that failure of another system cannot affect the CFS, nor can failure of one feedwater line affect the other feedwater lines. Inside the RB, the feedwater lines are routed separately in the SG bunkers with no others lines, so that failure of another system cannot affect the CFS nor can failure of one feedwater line affect the other feedwater lines. Inside the SB, but outside the valve rooms, there are no components capable of producing internal missiles which could affect the CFS. Inside the valve rooms, the feedwater piping is routed in four individual and separated trains so that there is no source of internal

Flow control of the main condensate for cooling the first stage steam generator blowdown cooler is described in Section 10.4.8.

An ultrasonic flow meter in the feedwater lines measures feedwater flow and temperature, and provides input to the core power calorimetric calculation. Refer to Section 7.7 for a description of flow meters used for feedwater flow control.

10.4.7.6 References

1. ASME B31.1, "Power Piping," The American Society of Mechanical Engineers, 2004.

2. ASME Boiler and Pressure Vessel Code, Section III, "Rules for Construction of Nuclear Facility Components," Class 2 Components, The American Society of Mechanical Engineers, 2004.

3. ASME Boiler and Pressure Vessel Code, Section III, Division 1, Subsection NC including Article NC-7000: "Overpressure Protection," The American Society of Mechanical Engineers, 2004.

4. ASME Boiler and Pressure Vessel Code, Section III: "Rules for Construction of Nuclear Facility Components," Division 1, Subsection ND: Class 3 Components, The American Society of Mechanical Engineers, 2004.

5. NUREG-0800, BTP 10-2, "Design Guidelines for Avoiding Water Hammers in Steam Generators," Revision 4, U.S. Nuclear Regulatory Commission, March 2007,

6. NUREG-0927, "Evaluation of Water Hammer Occurrence in Nuclear Power Plants," Revision 1, U.S. Nuclear Regulatory Commission, March 1984.

7. ASME Boiler and Pressure Vessel Code, Section XI: "Rules for Inservice Inspection of Nuclear Power Plant Components," The American Society of Mechanical Engineers, 2004.

8. ~~Generic Letter 89-08, "Erosion/Corrosion-Induced Pipe Wall Thinning," U.S. Nuclear Regulatory Commission, May 2, 1989.~~

9. ~~NSAC-202L-R3, "Recommendations for an Effective Flow-Accelerated Corrosion Program," Electric Power Research Institute, 2006.~~

10.03.06-4